



# **The Science of Early Childhood Development**

## **Closing the Gap Between What We Know and What We Do**

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# **The Importance of Viewing the Needs of Children in a Broad Context**

**Beyond its intrinsic value as a compelling moral responsibility, the healthy development of all young children benefits all of society by providing a solid foundation for responsible citizenship, economic productivity, strong communities, and sustainable democracy and prosperity.**

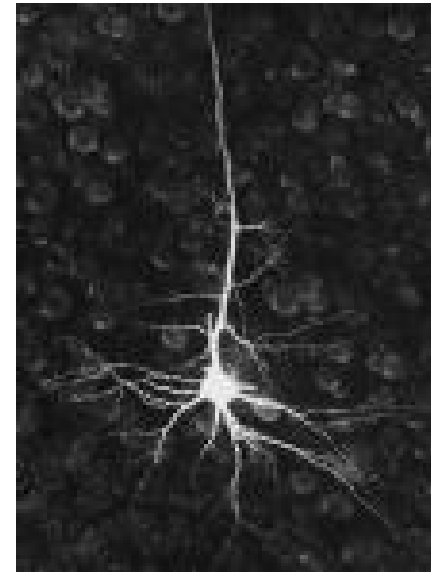
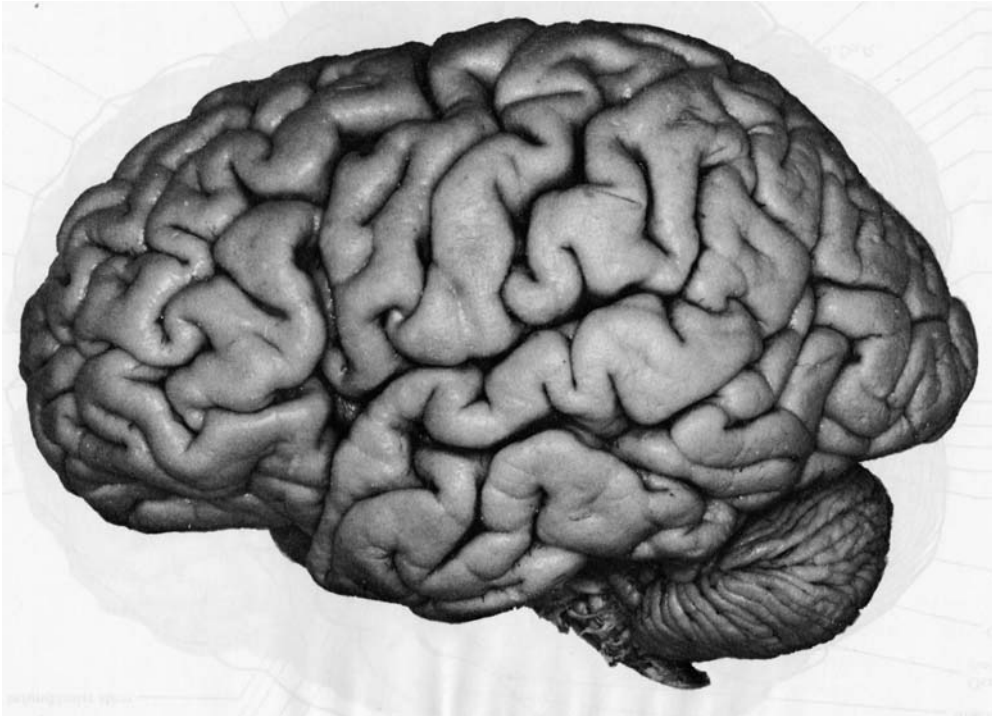


# Core Concepts of Development

**Convergence of neuroscience,  
developmental psychology,  
and the economics of human  
capital formation**



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## **Brains are Built Over Time**

- **The early years of life matter because the ongoing interaction between early experience and gene expression affects the architecture of the maturing brain.**
- **As it emerges, the quality of that architecture establishes either a sturdy or a fragile foundation for all the learning and behavior that follow.**



# **Social, Emotional, and Cognitive Development are Highly Interrelated**

- **Emotional well-being and social competence provide a strong foundation for emerging cognitive abilities.**
- **Social skills, emotional health, and cognitive capacities are all important prerequisites for success in school and later in the workplace.**



# Brain Architecture and Skills are Built in a Hierarchical “Bottom-Up” Sequence

- **Neural circuits that process basic information are wired earlier than those that process more complex information.**
- **Higher circuits build on lower circuits, skills beget skills, and the development of higher level capabilities is more difficult if lower level circuits are not wired properly.**



# **Brain Plasticity and the Ability to Change Behavior Decrease Over Time**

- **Brain circuits stabilize with age, making them increasingly more difficult to alter.**
- **The window of opportunity for adaptive development remains open for many years, but the costs of remediation grow over time.**
- **It is more efficient, both biologically and economically, to get things right the first time than to try to fix them later.**



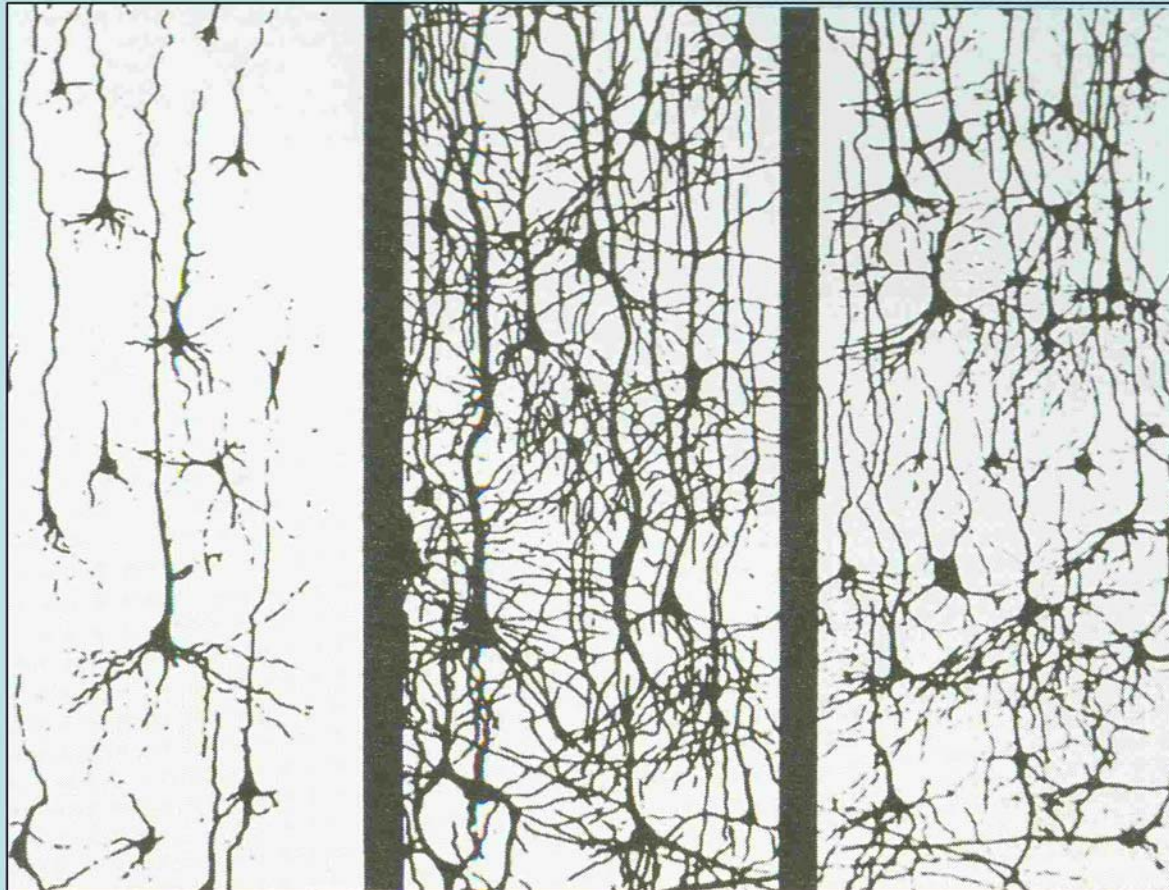


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**At Birth**

**6 Years Old**

**14 Years Old**





# **Relationships are the “Active Ingredients” of Early Experience**

- **Nurturing and responsive relationships build healthy brain architecture that provides a strong foundation for learning, behavior, and health.**
- **When protective relationships are not provided, elevated levels of stress hormones disrupt brain architecture by impairing cell growth and interfering with the formation of healthy neural circuits.**



# **Early Childhood Adversity Can Influence a Range of Lifelong Outcomes**

**Research on the biology of stress helps explain some of the underlying reasons for differences in learning, behavior, and physical and mental health.**



## Positive Stress

- **Moderate, short-lived stress responses, such as brief increases in heart rate or mild changes in stress hormone levels.**
- **Precipitants include the challenges of meeting new people, dealing with frustration, getting an immunization, or adult limit-setting.**
- **An important and necessary aspect of healthy development that occurs in the context of stable and supportive relationships.**



## **Tolerable Stress**

- **Stress responses that could disrupt brain architecture, but are buffered by supportive relationships that facilitate adaptive coping.**
- **Precipitants include death or serious illness of a loved one, a frightening injury, parent divorce, terrorism, a natural disaster, or homelessness.**
- **Generally occurs within a time-limited period, which gives the brain an opportunity to recover from potentially damaging effects.**





## Toxic Stress

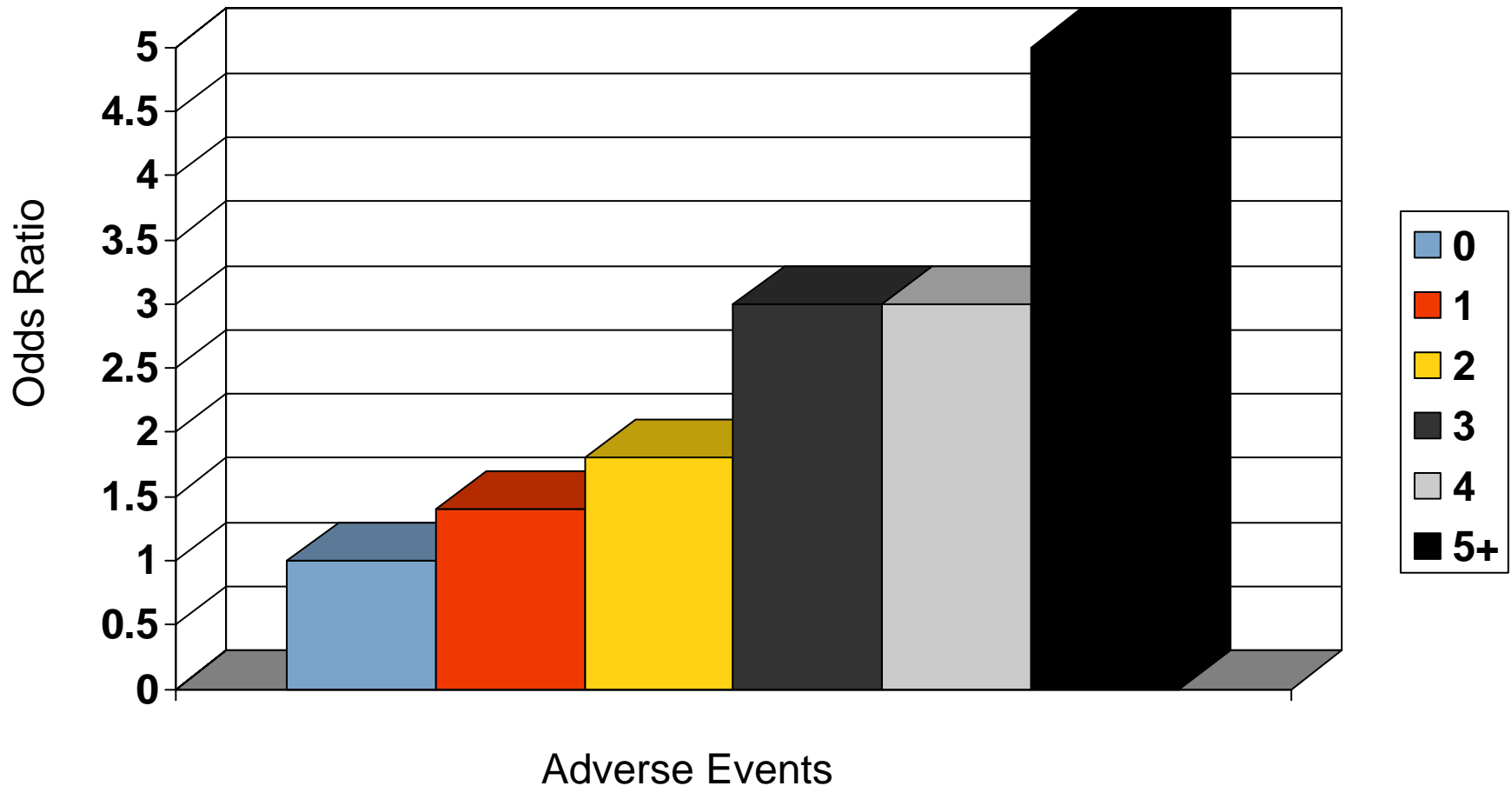
- **Strong and prolonged activation of the body's stress management systems in the absence of the buffering protection of adult support.**
- **Precipitants include extreme poverty, physical or emotional abuse, chronic neglect, severe maternal depression, substance abuse, or family violence.**
- **Disrupts brain architecture and leads to stress management systems that respond at relatively lower thresholds, thereby increasing the risk of stress-related physical and mental illness.**



# Data To Think About



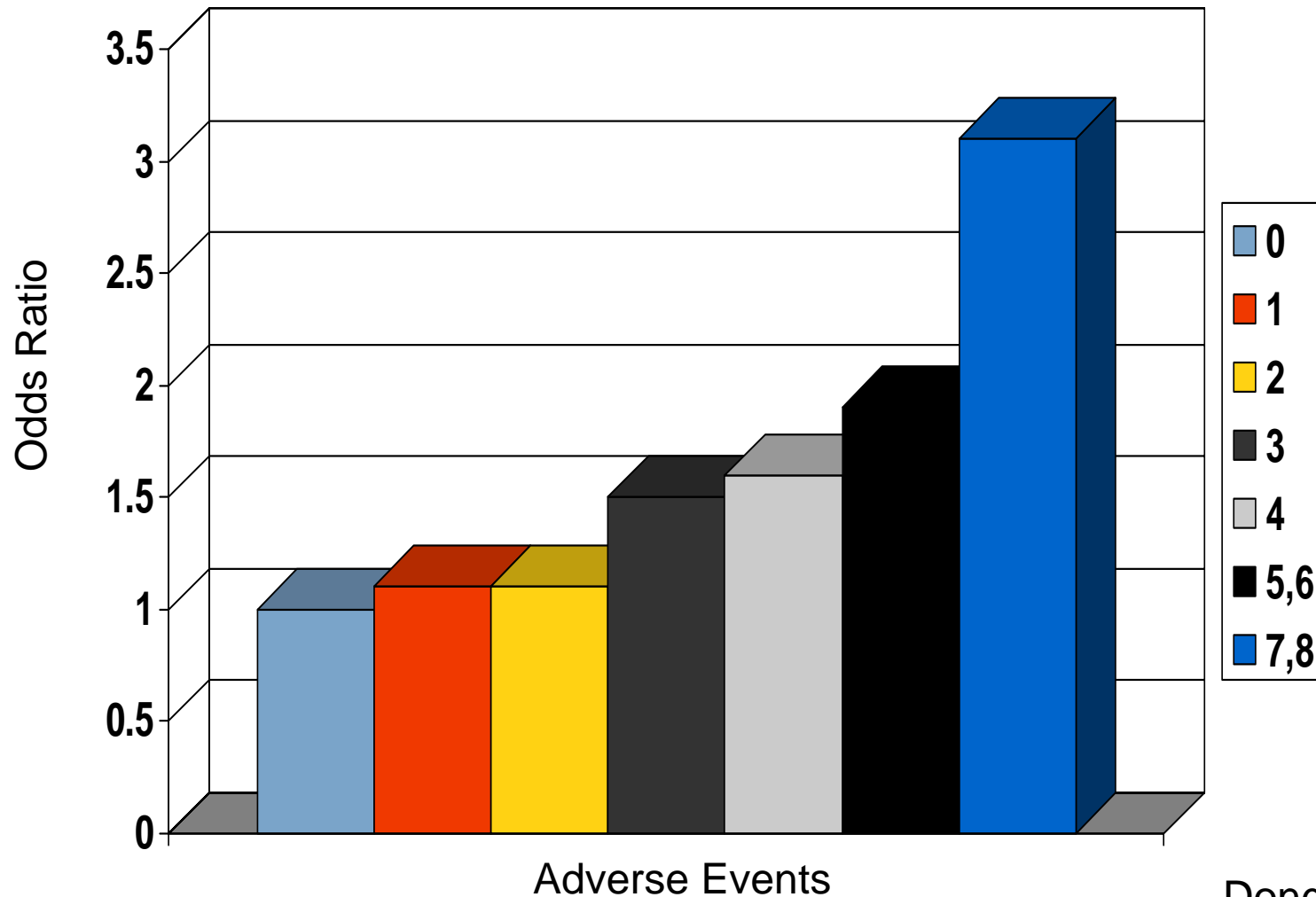
# Adverse Childhood Events and Adult Depression





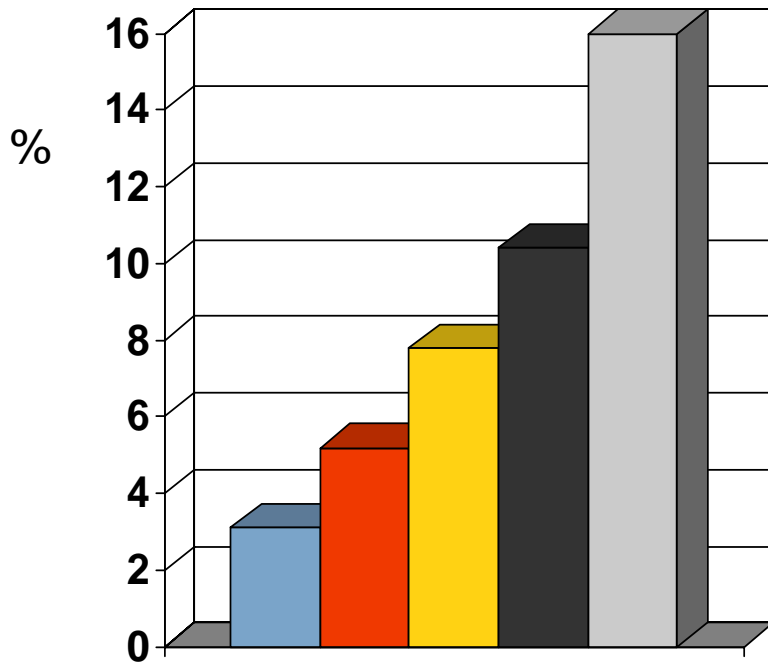


# Adverse Childhood Events and Adult Ischemic Heart Disease

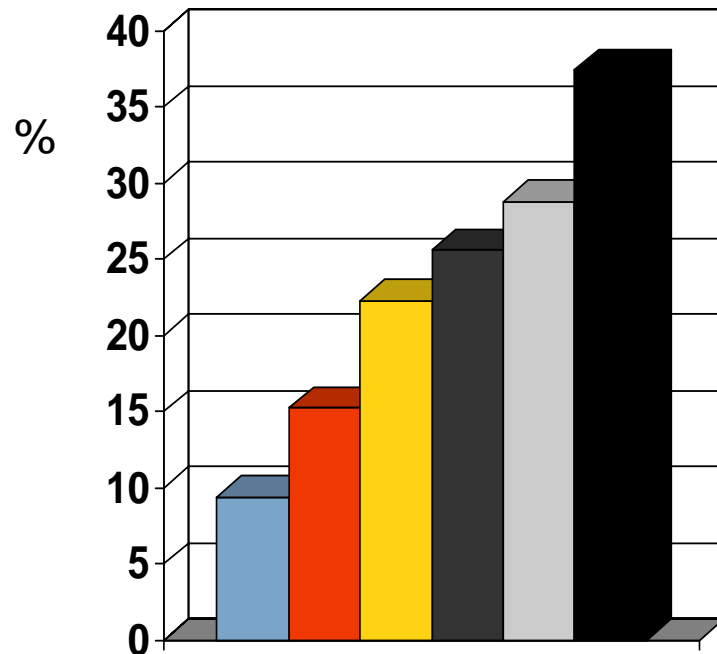




# Adverse Childhood Events and Adult Substance Abuse



Self-Report: Alcoholism  
Dube et al, 2002



Self-Report: Illicit Drug Use  
Dube et al, 2005



# Importance of Emotional Development

- In a study of 211 children under age 3 with newly opened child protection cases and completed developmental evaluations, 55% had documented delays or established conditions that met eligibility criteria for IDEA-Part C early intervention services (MECLI, 2005).
- In a survey of 119 preschool teachers, 39% reported expelling at least one child from their program in the preceding year (Gilliam, 2004).



## Benefits of Early Intervention

- **Perry Preschool Project follow-up data at age 40 indicate a total benefit-cost ratio of 17:1 (4:1 for participants and 13:1 for the public), with annual internal rates of return of 18% (1% participant gain and 17% public benefit).**
- **Participant benefits are derived largely from higher earned income.**
- **Public benefits include higher tax revenues and lower costs for special education, welfare support, and incarceration.**



# **Implications for Policy and Practice**



# **Human Capital Formation Requires a Balanced Approach**

**If we really want to build a strong platform for healthy development and effective learning in the early childhood years...**

**then we must pay as much attention to children's emotional well-being and social capacities as we do to their cognitive abilities and academic skills.**



# Quality Interventions Make a Difference

**Services for vulnerable, young children can have positive impacts on brain development that generate a significant return on investment over a lifetime...**

**but they require the quality and sustainability that comes from low staff turnover and well trained personnel with expertise that matches the needs of the children and families served.**



# **Science Points Toward a Two-Pronged Approach to Early Care and Education**

- **Broad access to high-quality preschool for 3 and 4 year olds, with proactive enrollment from low-income families, can be an effective strategy to reduce early inequalities in opportunity.**
- **Targeted intervention for children experiencing toxic stress is essential from birth to reduce threats to early brain development that can lead to later problems in learning, behavior, and both physical and mental health.**





# **Policies that Affect Children Extend Beyond Health Care and Education**

**If we really want to promote better outcomes for children, then we must apply the science of early childhood and early brain development to a broad range of policies ...**

**including welfare reform, housing, family and medical leave, adult mental health, and environmental protection, among others.**



# Challenges For Society



# **Rethinking the Balance Between Individual and Shared Responsibility for Child Health and Development**

**Need for new, bipartisan strategies to build broad-based public will that recognizes the complementary (not mutually exclusive) responsibilities of family, community, workplace, and government to promote the healthy development of all young children.**



# **The Search for New Champions**

**Need for fresh leadership in both the public and private sectors to address significant inequalities in opportunity, beginning in the earliest years of life, as both a moral responsibility and a critical investment in the nation's social and economic future.**



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**[www.developingchild.net](http://www.developingchild.net)**